WHAT IS CLAIMED IS:

1. A charged particle beam exposure apparatus, comprising:

a beam gun which emits a charged particle beam;

a projection optics which shapes said charged particle beam and projects a desired pattern;

an incident energy control circuit which controls an incident energy of said projection optics;

a sample stage loaded with a sample in which an image projected from said projection optics is to be formed, a plurality of first marks are formed beforehand, and a plurality of second marks are exposed to said charged particle beam with a first incident energy by said projection optics in the vicinity of said plurality of first marks;

a detector to detect an electron signal generated from a region including said plurality of first marks and said plurality of second marks, when said region is scanned with a second incident energy different from said first incident energy;

a calculation circuit which calculates a positional shift amount between said plurality of first marks and said plurality of second marks from said detected electron signal;

a correction circuit which corrects positions of said plurality of first marks on said sample based on said calculated positional shift amount; and

an exposure control circuit which aligns said desired pattern based on corrected positions of said plurality of first marks.

2. The charged particle beam exposure apparatus according to claim 1, further comprising an optical microscope which measures said positions of said plurality of first marks.

3. The charged particle beam exposure apparatus according to claim 2, wherein said optical microscope to measure said positions of said plurality of first marks measures some of the positions of said plurality of first marks, and calculates the other positions of said plurality of first marks based on measurement results of said some positions.

4. The charged particle beam exposure apparatus according to claim 1, wherein said second incident energy is smaller than said first incident energy.

5. The charged particle beam exposure apparatus according to claim 4, wherein said second incident energy is 3 keV or less.

6. The charged particle beam exposure apparatus according to claim 1, further comprising a power supply which applies a voltage to said sample in order to allow said first incident energy and said second incident energy to differ from each other.

7. The charged particle beam exposure apparatus according to claim 1, further comprising a charged

particle beam optics to which said second incident energy is inputted separately from said projection optics in order to allow said first incident energy and said second incident energy to differ from each other.

8. The charged particle beam exposure apparatus according to claim 1, wherein said first mark is formed on the surface of said sample, and said second mark is a latent image formed on a resist layer disposed on said sample.

9. The charged particle beam exposure apparatus according to claim 1, wherein an acceleration voltage of said beam gun is in a range of 1 keV to 8 keV.

10. The charged particle beam exposure apparatus according to claim 1, further comprising a reference mark for correcting a baseline shift on said sample stage.

11. A charged particle beam exposure method comprising:

exposing a second mark on a sample to a charged particle beam with a first incident energy based on a position of a first mark formed beforehand on said sample;

scanning a region including said first mark and said second mark with said charged particle beam with a second incident energy;

detecting an electron signal generated from said sample by said scanning;

calculating a positional shift amount between said first mark and said second mark from said detected electron signal;

correcting said position of said first mark on said sample based on said calculated positional shift amount; and

aligning and exposing a desired pattern based on said corrected position of said first mark.

12. The charged particle beam exposure method according to claim 11, further comprising: measuring said position of said first mark formed on said sample by an optical microscope.

13. The charged particle beam exposure method according to claim 12, wherein said measuring of said position of said first mark by said optical microscope comprises: measuring some of said positions of said plurality of first marks formed on said sample; and calculating the other positions according to measurement results.

14. The charged particle beam exposure method according to claim 11, wherein said exposing of said second mark comprises exposing a resist formed on said sample.

15. The charged particle beam exposure method according to claim 14, wherein the scanning with said second incident energy comprises setting a range of said second incident energy to be smaller than a film

thickness of said resist.

16. The charged particle beam exposure method according to claim 11, wherein said exposing of said second mark comprises setting said first incident energy to 8 keV or less.

17. The charged particle beam exposure method according to claim 11, wherein said scanning with said second incident energy comprises setting said second incident energy to 3 keV or less.

18. The charged particle beam exposure method according to claim 11, wherein said scanning with said second incident energy comprises applying a bias voltage to said sample.

19. The charged particle beam exposure method according to claim 11, wherein said scanning with said second incident energy comprises allowing a charged particle beam exposure optics which generates said charged particle beam having said second incident energy to differ from a charged particle beam optics which generates said charged particle beam having said first incident energy.

20. The charged particle beam exposure method according to claim 12, further comprising: detecting a position of a mark formed on a sample stage loaded with said sample or on said sample by said optical microscope and said charged particle beam; and detecting a drift of a reference position of said

charged particle beam from a difference between said position detected by said optical microscope and said position detected by said charged particle beam.